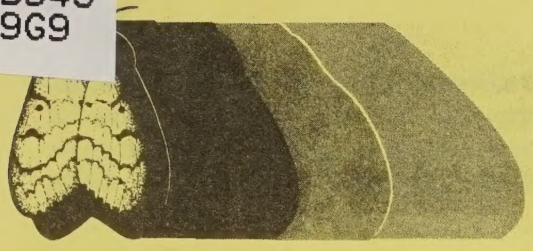

MAY 1980

NUMBER TWO

GYPSY MOTH NEWS

370 REED ROAD, BROOMALL, PA 19008
U.S.D.A., FOREST SERVICE

SUPPRESSION AND REGULATORY PROGRAMS, 1980

THREE STATES TO SPRAY GYPSY MOTH

The State of New Jersey, which received more gypsy moth defoliation in 1979 than other cooperative suppression program participants (see October 1979 newsletter), will have the largest program this year. The NJ Department of Agriculture plans to treat 55,000 acres in 18 counties to protect valuable residential and recreational forest resources from severe larval feeding. In all, 15,000 acres will be treated with Bacillus thuringiensis (B.t.) (Thuricide 16B), and 40,000 acres with carbaryl (Sevin-4-Oil). In addition, the Bureau of Forest Management of the NJ Department of Environmental Protection plans to treat 8,108 acres of state-owned forests, parks, and fish and game tracts located in 10 counties. Treatments will be made with carbaryl (Sevin-4-Oil).

For the second consecutive year, the State of New York will participate in the cooperative suppression program. The NY Department of Environmental Conservation will treat 50,000 acres of forest recreation areas, forest communities, and high value forests in 20 counties. The following biological and chemical insecticides will be aerially applied: nucleopolyhedrosis virus (GYPCHEK)--5,000 acres; Bacillus thuringiensis (Thuricide 16B and 24B)--20,000 acres; diflubenzuron (Dimilin W-25)--6,000 acres; carbaryl (Sevin-4-Oil)--10,000 acres; trichlorfon (Dylox 1.5 Oil)--7,000 acres. In addition, 2,000 acres will be treated with acephate (Orthene Forest Spray) applied from the ground.

Compiled by the Forest Insect and Disease Management Staff, Delaware, Ohio

The third participant in this year's suppression project is the State of Pennsylvania. Despite a dramatic decline in gypsy moth defoliation statewide last season, populations appear to be on the rise in central and mideastern Pennsylvania. The PA Department of Environmental Resources plans to treat 26,000 acres of high-use, high-value forest areas in 14 counties. Primary treatments will consist of trichlorfon (Dylox 1.5 Oil); however, selected environmentally sensitive areas will be treated with Bacillus thuringiensis (Dipel 4L).

In a related activity, the USDA Forest Service's Forest Insect and Disease Management (FIDM) staff in Delaware, OH, has assigned at least one representative per state to work closely with state project supervisors in planning and training activities. Federal personnel will be on site monitoring aerial insecticide applications, and when necessary will work with project supervisors to improve project efficiency and safety.

CONTROL OF OUTLYING INFESTATIONS CONTINUED

The USDA Animal and Plant Health Inspection Service (APHIS), in cooperation with affected States, will continue eradication treatments of isolated infestations to retard the spread of gypsy moth in the United States. This year, outlying infestations covering 29,480 acres in four states will be treated. Nine isolated areas in southern Michigan, two sites each in Illinois and Ohio, and one site in Virginia comprise the 1980 eradication program. Most of the acreage will be treated with diflubenzuron, but carbaryl or trichlorfon will be used in areas of human habitation. Finally, the core project located in central Michigan, and the scene of much activity last season (see October 1979, newsletter), will be continued in 1980.

APHIS REVISES GYPSY MOTH QUARANTINE

After several years in the preparation stage, a revised Gypsy Moth Quarantine was published in the Federal Register on March 11, 1980. APHIS, Plant Protection and Quarantine, advises that there are two major changes from the previous document. First, the regulated areas are further separated into "High Risk" and "Low Risk." Inspection and certification of regulated commodities will be required only from High Risk areas to nonregulated areas. No certification is needed into or from Low Risk areas. This change places the quarantine on a more sound biological base.

The second major change allows the free movement of logs to specific destinations (establishments such as pulp and veneer mills) when it has been determined jointly by PPQ and state officials that the minimal risk involved can be controlled. This provision is not expected to result in a large number of approved destinations; however, those anticipated will significantly reduce the inspection workload.

In related gypsy moth regulatory activities, APHIS plans to treat 38,385 acres to minimize the spread of gypsy moth from infested campsites and similar areas. Approximately 494 campgrounds located in the Northeastern States will be treated with acephate, carbaryl, or trichlorfon.

EPA ANNOUNCES SPRAY GUIDELINES

In February, the Environmental Protection Agency submitted its comments to the 1980 gypsy moth Draft Environmental Impact Statement (DEIS). Included in these comments were requirements for ¼-to ½-mile buffer strips around dwellings and public roads for the biological and chemical insecticides used in suppression and regulatory programs. Considering the target areas for gypsy moth spray activities, these guidelines would have forced cancellation of most of the proposed suppression and regulatory program. Anxious state and USDA officials subsequently met with EPA officials to present their concerns. As a result of those meetings, the EPA agreed to revise its comments to the DEIS and adjust the spray guidelines.

The revised guidelines provide that if there is public participation in spray decisionmaking and advance notification, buffer zone and other requirements beyond label instructions need not be followed. In addition, buffer zone requirements were removed for Bacillus thuringiensis, GYPCHEK, and Disparlure except around municipal water supplies, and in the case of Disparlure, critical fisheries. When no public participation is accommodated, spray guidelines will require buffer zones ranging from 150 feet around certain waters to 500 feet around municipal water supplies and dwellings.

The revised buffer strip guidelines are presented in the comments section (Appendix D) of the Final Environmental Impact Statement for Cooperative Gypsy Moth Suppression and Regulatory Program, 1980 Activities. Copies of the Final Gypsy Moth EIS can be obtained by writing to:

USDA Forest Service
NA, State and Private Forestry
370 Reed Road
Broomall, PA 19008
ATTN: FIDM

SPECIAL PROJECTS

GYPCHEK FIELD DOSAGE EVALUATIONS

The Animal and Plant Health Inspection Service (APHIS) will conduct field evaluations of various GYPCHEK dosages during the spring of 1980. Currently the registered dosage rate for GYPCHEK ranges from 25 million to 125 million Gypsy Moth Potency Units (GMPU) per acre. This dosage range reflects, according to laboratory data, significant variations in larval susceptibility among different geographic populations of gypsy moth. The objective of the APHIS project is to establish a single registered dosage of GYPCHEK that will be efficacious and cost effective for all or most gypsy moth populations.

The project will evaluate four dosages of GYPCHEK: 25 million, 62.5 million, 125 million and 250 million GMPU. The project will be supervised by the APHIS, Otis Methods Development Center and conducted in Massachusetts. The Northeastern Forest Experiment Station's Forest Insect and Disease Laboratory in Hamden, CT., will coordinate virus evaluations, GYPCHEK preparation and data analysis.

Two separate projects will be undertaken simultaneously to evaluate four dosages of GYPCHEK: 25 million, 62.5 million, 125 million, and 250 million GMPU. The Forest Service, FIDM, will supervise one project in New Jersey, and APHIS, Otis Methods Development Center, will supervise the other project in Massachusetts. The Northeastern Forest Experiment Station's Forest Insect and Disease Laboratory at Hamden CT., will coordinate virus evaluations, GYPCHEK preparation, and data analysis for both projects.

In related activities, the pesticide testing program at the Otis Methods Development Center will also concentrate on evaluation of two new formulations of B.t. made available by Abbott and Sandoz. There will also be field tests to evaluate the effects of adding stickers to the formulations. Laboratory results indicate that most B.t. formulations now available have poor weathering properties. Field tests designed to evaluate the efficacy of the Mobay product, SIR 8514, will also be conducted.

FOREST SERVICE TO EVALUATE VIRUS DETECTION TECHNIQUE

A research laboratory technique for detecting gypsy moth nucleopolyhedrosis virus (NPV) in natural populations has been developed by Dr. Normand DuBois of the Forest Insect and Disease Laboratory, Hamden, CT. The technique is based on a refractometric analysis of the hemolymph of instar III gypsy moth larvae.

The FIDM staff at Delaware, OH, will cooperate with Dr. DuBois to evaluate the accuracy and feasibility of using the technique for predicting a gypsy moth population collapse in natural populations. With the cooperation of several state and federal agencies, egg masses will be collected from specific areas which represent a variety of gypsy moth infestation histories--some expected to be healthy and others suspected to succumb to natural virus epizootic during larval development. This broad sampling of egg masses will provide a reasonable sampling of different populations to evaluate the reliability of this technique for predicting virus outbreak in a gypsy moth before to natural egg hatch in late April.

In practical use, if egg masses were collected after diapause, they could be hatched in the laboratory, reared to instar III, and analysed for virus disease. Such an analysis could be completed by the end of March or mid-April, and a determination could then be made on whether the pest population should be sprayed or whether it would be expected to be depleted naturally from a virus epizootic.

APHIS TO EVALUATE STERILE MALE TECHNIQUE AND DISPARLURE

A major field trial of a sterile male technique will be conducted in Berrien County, Michigan, in cooperation with the Michigan Department of Agriculture and U.S. Forest Service. Sterile males will be released into an isolated infestation throughout the course of the season and intensive monitoring will be conducted to determine whether the degree of interaction with the natural population occurs as expected, based on the fertile:sterile ratio achieved. Additional studies will be conducted in the East to evaluate the competitiveness of sterile F_1 progeny from parents receiving substerilizing doses of radiation. It is thought that inherited sterility may provide an avenue whereby the sterile male technique may find application in the Northeast.

Pilot tests using two formulations of Disparlure for eradication of isolated infestations will also be conducted in Michigan. Also, follow-up evaluations of similar treatments in Wisconsin in 1979 will be conducted this year. Tests are also being planned for south-central Pennsylvania in which the effect of population density on Disparlure efficacy will be assessed. Applications of 50 grams per ha will be applied to populations ranging from 2.5 to 250 egg masses per ha. It is intended that the studies will better delineate the population densities in which the mating disruption technique can be expected to be effective.

INTEGRATED PEST MANAGEMENT (IPM) DEVELOPMENT

The NY State Department of Environmental Conservation in cooperation with the U.S. Forest Service, FIDM, is now entering the third and final year of pilot testing of an integrated pest management system for gypsy moth suppression, and implementation of the alternative or alternatives that best meet the needs of landowners on a local basis. In 1980, treatments with GYPCHEK, carbaryl, *Bacillus thuringiensis*, diflubenzuron, trichlorfon, and Disparlure will be made in four counties.

The PA Department of Environmental Resources, Division of Forest Pest Management, will conduct a pilot project this summer to determine if gypsy moth populations can be reduced before causing severe defoliation by introducing the tachinid parasite, Parasetigena silvestris, and by applying suboptimal dosages of Dimilin, Dylox, or B.t. to supplement expected mortality from P. silvestris. This strategy would require less pesticide than presently required to prevent defoliation and should make the treatment of nonresidential forested areas, presently neglected, more economical and environmentally acceptable.

In a matter associated with IPM, Pennsylvania officials report that the exotic gypsy moth parasite rearing program is going through a phasedown period due to the lack of "establishable" new material. Inoculative releases of Apenteles sp. (India), Brachymeria lasus, Coccygomimus disparis, and Exorista japonica will be completed this year. Attempts to recover these four parasites will be made in 84 release sites that were established in 1978-79.

USDA AGENCIES CONTINUE WORK ON LEADING EDGE

The Forest Service and APHIS, with technical support from the Science and Education Administration (SEA), will continue to evaluate a strategy to retard the natural spread of the gypsy moth in Pennsylvania. The USDA pilot project was implemented in 1979 and is scheduled to continue for an additional 4 years. In 1979, 47,700 acres of the Appalachian ridge system in Mifflin, Juniata, and Huntington Counties were treated as follows: diflubenzuron (43,000 acres); gypsy moth NPV (GYPCHEK) (5,000 acres); B.t. (5,000 acres); B.t. and Disparlure in combination (5,000 acres); and Disparlure alone (5,000 acres). An untreated check area of 16,000 acres will provide assessment of natural spread along the ridges. The effectiveness of the intervention strategy in retarding spread will be based on comparative analyses of annual gypsy moth egg mass surveys, male moth trapping surveys, and surveys of gypsy moth-caused tree defoliation. In addition, evaluation activities will assess the effects of the intervention strategy on gypsy moth parasitism throughout the treated areas and the occurrence of increased gypsy moth NPV levels in the GYPCHEK-treated area.

Although an entomological evaluation of the 1979 intervention strategy will continue until 1984, some accomplishments are now evident.

1. The project demonstrated that with proper preparation the public will accept large-scale application of biological insecticides to undeveloped forest lands for suppression of the gypsy moth.

2. The use of GYPCHEK (NPV) proceeded from the experimental stage to field-scale operations. More than 20,000 gallons of GYPCHEK formulation were mixed and applied without major problems.

3. The technology employed in formulating and applying Disparlure from multiengine aircraft to 10,000 acres of forest land demonstrated the operational feasibility of large-scale application of the gypsy moth pheromone as currently formulated.

4. The feasibility of applying Dimilin from multiengine aircraft to large tracts of Pennsylvania ridge lands was also demonstrated. This was accomplished in accordance with EPA guidelines and without protest from the public or environmental groups. This is important because the relatively low total cost and ease of application of Dimilin makes it a likely prospect for use in an integrated system to manage gypsy moth on similar ridge lands elsewhere in the leading edge area.

Field evaluations for 1980 will include gypsy moth egg mass surveys, male moth trapping, defoliation surveys, and assessments of parasitism and virus levels. A pilot project report for the 1979 activities is available upon request.

WILDLIFE HABITAT STUDY CONTINUES

During the fall of 1979, the FIDM staff in Delaware, OH, collected data on vegetation from 72 plots in eastern Pennsylvania and 15 plots in northern New Jersey to evaluate the long-term impact of gypsy moth-caused tree mortality on wildlife habitat, tree regeneration, and timber stands (see October 1979, newsletter). Data were quantified on species, plant form, and structure of all existing vegetation, and on tree size and grade for commercial sawtimber.

Project data are currently being readied for analysis on computer programs available through the U.S. Forest Service. These programs will:

1. Graphically display the vertical vegetative structure by life form components;

2. Screen data elements for their suitability for selected nongame birds and mammals, e.g., optimal tree stocking, species composition, or vegetative cover;

3. Provide valuations for timber and pulpwood; and,

4. Analyze early succession and potential stocking of forest trees.

A project report should be available later this year.

RELATED NEWS

INEBRIATED TREES AND TWO-LINED CHESTNUT BORER?

Studies in 1979 by the Forest Insect and Disease Laboratory, Hamden CT, have suggested that Armillaria mellea root rot and Agrilus bilineatus, two-lined chestnut borer, might be more highly attracted to gypsy moth-defoliated oak trees that have a high ethanol content than those that do not. Dr. Philip Wargo's group injected trees with ethanol in the summer and found later in the fall that 70 percent of the injected trees were attacked by the two-lined chestnut borer, and 80 percent of the trees were infected with Armillaria root rot.

Although these are preliminary results, it is possible that where excessive moisture might exist at the time of defoliation and afterward, ethanol production in the waterlogged roots of defoliated trees may stimulate attack of the roots by Armillaria and of the stem by A. bilineatus.

Additional work will be undertaken this summer.

OREGON AND NEBRASKA RECORD FIRST GYPSY MOTH CATCHES

APHIS reports that in 1979, male gypsy moths were trapped in Oregon and Nebraska, two states where the insect had not been previously caught. In Oregon, a moth was caught in each of two traps in Clackamus County. Another moth was caught in Lancaster County near Lincoln, Nebraska.

Moths also were caught in 1979 for the first time in the California counties of Los Angeles and Santa Barbara; in Orange and Hernando Counties, Florida; in DeKalb, Henry, and Jefferson Counties, Illinois; in Garrett County, Maryland; in Kalamazoo, Lake, and Muskegon Counties, Michigan; in Dakota County, Minnesota; in Craven County, North Carolina; in Brown, Clark, Huron, Medina, and Ottawa Counties, Ohio; in Greens, Mercer, and Washington Counties, Pennsylvania; in Georgetown County, South Carolina; and in Culpeper, Floyd, and Montgomery Counties, Virginia.

Other states recording gypsy moths in 1979--besides the generally infested area of New England, New York, New Jersey and Pennsylvania--include: Delaware, Tennessee, Washington, West Virginia, and Wisconsin. Moths also were trapped in the District of Columbia.

The State of West Virginia reports that it will cooperate with APHIS in placing more than 4500 pheromone traps statewide in 1980. In addition, larval traps (burlap bands) will be placed on trees in areas where male moths were caught in 1979.

The Wisconsin Department of Agriculture, Trade and Consumer Protection, reports pheromone traps will again be placed in the southern third of the state this summer.

DO BIG TRAPS CATCH MORE MOTHS?

That is what the Otis Methods Development Center will find out this summer. Field tests are planned to evaluate the relative effectiveness of the Delta trap and a newly designed large-capacity trap for gypsy moth detection survey.

In a related study, the State of Maryland in 1979 evaluated two types of pheromone traps. Field evaluations of a "milk container" type trap and the Delta trap showed that the milk carton type caught more male moths, were less destructive to nontarget insects, were easier to set up correctly, and were less likely to be lost or stolen.

NEW PHEROMONE PRODUCT REGISTERED

A new gypsy moth pheromone product from Herculite Products has recently been registered by EPA. The new product called HERCON DISRUPT®, GYPSY MOTH MATING DISRUPTANT, consists of flakes that release Disparlure over a period of time. The product is designed for aerial application.

This is the Hercon group's second Disparlure product. The first, registered last year, is Hercon Luretape®; it is designed for manual placement.

GYPSY MOTH HANDBOOK SERIES

Many inquiries have been made in the past year concerning titles and availability of the Gypsy Moth Handbook Series. Supplies of many of these publications are limited and, in some instances, unavailable. For the convenience of our readers, all available handbooks and notations are listed below. Requests for these handbooks can be made through the U.S. Forest Service in Broomall, PA., or through our field office in Delaware, OH.

† Gypsy Moth Egg-Mass Sampling with Fixed- and Variable-Radius Plots.
Agriculture Handbook No. 523

Predators of the Gypsy Moth
(Stock # 001-000-03851-6) $2.40
Agriculture Handbook No. 534

Technological Developments in Aerial Spraying
(Stock # 001-000-03871-1) $1.00
Agriculture Handbook No. 535

Diseases of the Gypsy Moth: How They Help to Regulate Populations. (Stock # 001-000-03889-3) $1.00
Agriculture Handbook No. 539

Selected Parasites and Hyperparasites of the Gypsy Moth, with Keys to Adults and Immatures.
(Stock # 001-000-03955-5) $2.50
Agriculture Handbook No. 540

Classifying Forest Susceptibility to Gypsy Moth Defoliation.
(Stock # 001-000-03932-6), $1.20
Agriculture Handbook No. 542

Using Pheromone Traps to Detect and Evaluate Populations of the Gypsy Moth. (Stock # 001-000-03870-2), $2.25
Agriculture Handbook No. 544

* Defoliation by the Gypsy Moth: How it Hurts Your Tree.
(Stock # 001-000-3747-1), $0.90
Home and Garden Bulletin No. 223

* Major Hardwood Defoliators of the Eastern United States.
(Stock # 001-000-03852-4), $1.20
Home and Garden Bulletin No.224

* The Gypsy Moth: An Illustrated Biography
(Stock No.: 001-000-03850-8), $1.10
Home & Garden Bulletin 225

Judging Vigor of Diciduous Hardwoods.
(Stock # 001-000-03892-3), $0.90
Agriculture Information Bulletin No. 418

† Extremely few copies available, contact the U.S. Forest Service. No longer available through Superintendent of Documents.

* Supplies plentiful, multiple copies available through the U.S. Forest Service.

All other handbooks are available through U.S. Forest Service in single copies only. Order multiple copies from Superintnedent of Documents. See stock number.

PHOTOGRAPHS NEEDED

Black and white photographs are needed for the next issue of Gypsy Moth News. Let your 1980 gypsy moth activities be known to all. Preserve them with photographs!

All past contributors to this newsletter will receive written notification on when to submit photographs. Other readers who wish to submit photographs should let us know before the end of June. Contact:

Noel Schneeberger
USDA, Forest Service, FIDM
359 Main Road
Delaware, Ohio 43015

O. K. shutterbugs, focus and shoot!
